

SUBGENUS *MESORTHACLADIUS* (DIPTERA, CHIRONOMIDAE) FROM CHINA

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Abstract *Orthocladius* (*Mesorthocladius*) from China is reviewed. One new species, *O. (M.) tornatilis* sp. nov., and one new record species, *O. (M.) vaillanti* Longton & Cranston, 1991, are described and illustrated as adult males. A key to the male imagines of the subgenus *Mesorthocladius* is presented.

Key words Diptera, Chironomidae, *Orthocladius*, *Mesorthocladius*, new species, China.

1 Introduction

The genus *Orthocladius* van der Wulp, 1874 is a common, speciose and widespread genus, and over 100 species have been described (Cranston *et al.*, 1989) in the Holarctic Region. The subgenus *Mesorthocladius* was erected by Sæther (2005). To date, six species have been recorded worldwide, of which four are Holarctic, one is Palearctic and two are Nearctic (Caldwell, 1998; Langton & Cranston, 1991; Makarchenko & Makarchenko, 2011; Sæther, 2005; Soponis, 1990; Wang, 2000; Yamamoto, 2004).

According to Sæther (2005), the male imagines of the subgenus *Mesorthocladius* are separable from those of other subgenera by a combination of characters: collar-like superior volsella, inferior volsella with ventral part not extended below dorsal part, anal point robust with rounded apex or broadly triangular, eyes extended dorsomedially, male-like or when female-like scutellars multiserial, anteprenotals numerous (9–27) and crista dorsalis prominent, scutellars usually multiserial, when uniserial to biserial eyes not female-like and anal point broadly triangular or anal lobe strongly projecting and sensilla chaetica present on both mid and hind leg, anal lobe of wing usually strongly projecting.

Wang (2000) recorded *O. (M.) frigidus* (Zetterstedt, 1838) from China, while it was included in *Orthocladius* s. str. Below one new species and two additional species of *O. (Mesorthocladius)* are recorded.

2 Methods and Material

The morphological nomenclature follows Sæther (1980). The material examined was mounted on slides following the procedure outlined by Sæther (1969). Measurements are given as ranges followed

by the arithmetic mean. In the figures of the male genitalia the dorsal aspect is shown to the left, the ventral aspect and apodemes to the right. All types are deposited in the College of Life Sciences, Nankai University, China (BDN).

3 Species Description

3.1 *Orthocladius (Mesorthocladius) frigidus* (Zetterstedt)

Chironomus frigidus Zetterstedt, 1838: 811.

Orthocladius (Euorthocladius) frigidus (Zetterstedt), Brundin, 1947: 21; 1956: 101.

Orthocladius (Orthocladius) frigidus (Zetterstedt), Soponis, 1987: 123; Oliver *et al.*, 1990: 32; Wang, 2000: 637.

Orthocladius (Mesorthocladius) frigidus (Zetterstedt), Sæther, 2005: 26; Makarchenko & Makarchenko, 2011: 117.

Material examined. 10 ♂♂, Sichuan Province, Ganzi Autonomous County, Yajiang River, 14 Nov. 1996, light trap, WANG Xin-Hua; 1 ♂, Gansu Province, Mt. Qilian, 24 June 1993, sweep net, WANG Xin-Hua; 2 ♂♂, Hebei Province, Mt. Wuling, 21 June 1995, light trap, BU Wen-Jun.

Diagnostic. The species can be separated from other members of the subgenus by having scutellars multiserial, superior volsella collar-like, inferior volsella long and narrow, and anal point parallel-sided with a rounded tip.

Remarks. Soponis (1987) gave a detailed description of this species. Soponis (1977) did not include *O. frigidus* (Zetterstedt) in any of the subgenera, whereas Brundin (1956) included the species in *Euorthocladius*. Soponis (1987) later transferred *O. frigidus* to *Orthocladius* s. str., primarily based on the pupa. Sæther *et al.* (2000), however, transferred the species back to *Euorthocladius* primarily based on the similarity with *O. rousellae* Soponis. Diagnoses and descriptions of all stages of

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O. (Euorthocladius) in the limited sense were given by Soponis (1990). The exclusion of *O. frigidus* from *Euorthocladius* by Soponis (1987) was based only on the fact that the pupae possess normally developed anal macrosetae. Other characters and stages are more similar to those of *O. (M.) rousellae* which apparently is the sister species of *O. (M.) frigidus*.

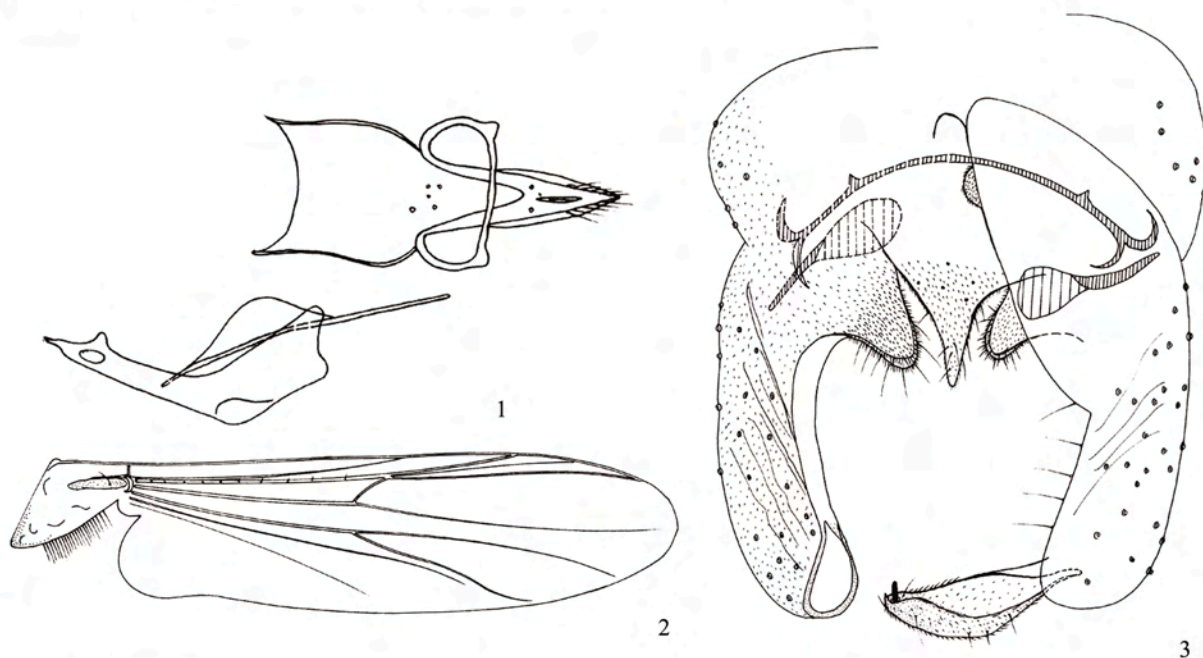
Distribution. The species has been recorded from

the Holarctic Region, and it occurs in both Palaearctic and Oriental China.

3.2 *Orthocladius (Mesorthocladius) tornatilis*

sp. nov. (Figs 1 – 3)

Holotype ♂, China, Jilin Province, Changbaishan Natural Reserve Area, 30 Apr. 1994, sweep net, WANG Jun-Cai.



Figs 1 – 3. *Orthocladius (Mesorthocladius) tornatilis* sp. nov. 1. Tentorium, stipes and cibarial pump. 2. Wing. 3. Hypopygium.

Diagnosis. The species can be separated from other members of the subgenus by having inferior volsella with rounded dorsal part, gonostylus widest medially, and crista dorsalis long and low.

Male ($n = 1$). Total length 3.43 mm. Wing length 2.58 mm. Total length / wing length 1.33. Wing length / length of profemur 2.48.

Coloration. Dark brown.

Head. AR 1.72. Ultimate flagellomere 810 μm long. Temporal setae 15, including 1 inner vertical, 6 outer verticals and 8 postorbitals. Clypeus with 11 setae. Cibarial pump, tentorium and stipes as in Fig. 1. Tentorium 176 μm long, 44 μm wide. Stipes 198 μm long, 68 μm wide. Palpomere lengths (in μm): 35, 57, 123, 101, 145. Length ratio of palpomeres 5/3 1.18.

Wing (Fig. 2). Anal lobe well developed. VR 1.03. Costal extension 20 μm long. R with 10 setae, other veins bare. Squamma with 24 setae.

Thorax. Anteprenotum with 10 setae. Dorsocentrals 17, acrostichals 7, prealars 5. Scutellars 48, multiserial.

Legs. Spur of fore tibia 66 μm , spurs of mid tibia 29 μm and 25 μm long, of hind tibia 74 μm and 28 μm

long. Comb of 12 setae, shortest seta 33 μm , longest seta 62 μm . Width at apex of fore tibia 55 μm , of mid tibia 38 μm , of hind tibia 59 μm . Pseudospurs present on ta_1 and ta_2 of mid and hind leg, 21 – 27 μm long. Sensilla chaeticae absent. Lengths (in μm) and proportions of legs in Table 1.

Table 1. Lengths (in μm) and proportions of legs segments of male *O. (M.) tornatilis* sp. nov.

	P ₁	P ₂	P ₃
fe	1 040	1 100	1 210
ti	1 230	1 120	1 400
ta ₁	900	540	800
ta ₂	540	350	475
ta ₃	390	280	360
ta ₄	255	180	220
ta ₅	160	150	165
LR	0.73	0.48	0.57
BV	2.36	2.88	2.80
SV	2.52	4.11	3.26
BR	2.50	3.13	2.30

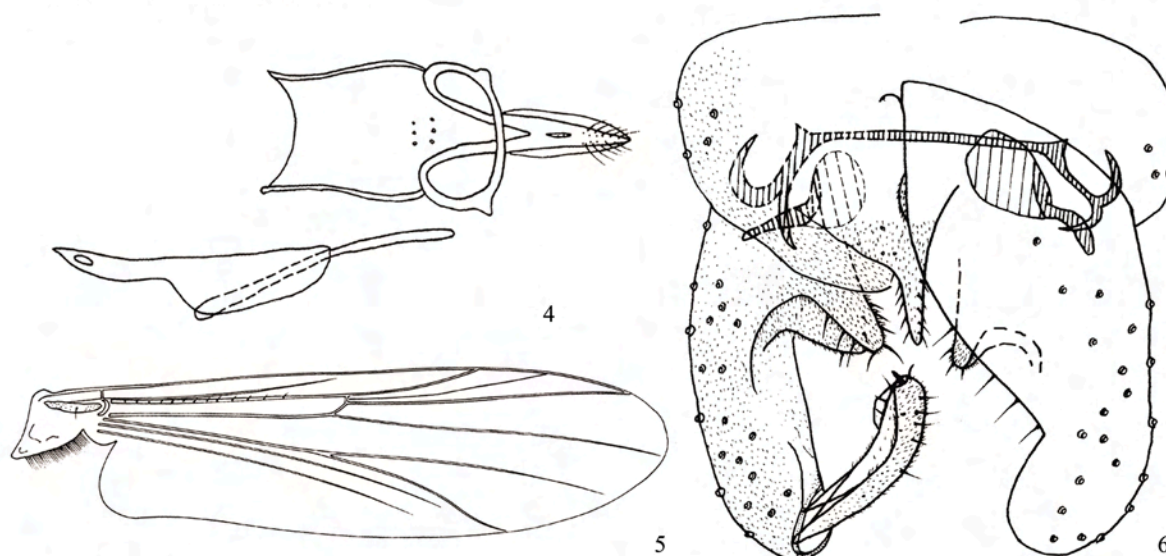
Hypopygium (Fig. 3). Tergite IX including anal point with 14 setae. Laterosternite IX with 10 setae.

Anal point 53 μm long, 18 μm wide. Phallapodeme 50 μm long; transverse sternapodeme 113 μm long, oral projections well developed. Gonocoxite 288 μm long, inferior volsella with dorsal part rounded apically, covering ventral part. Gonostylus widest medially, 120 μm long; crista dorsalis long and low; megasta 12 μm long. HR 2.40, HV 2.85.

Distribution. The species was collected in Jilin Province in Palaearctic China.

3.3 *Orthocladus* (*Mesorthocladius*) *vaillanti* Longton & Cranston (Figs 4–6)

Orthocladus (*Orthocladus*) *vaillanti* Langton & Cranston, 1991: 251; Caldwell *et al.*, 1997: 8; Caldwell, 1998: 235.



Figs 4–6. *Orthocladus* (*Mesorthocladus*) *vaillanti* Langton & Cranston. 4. Tentorium, stipes and cibarial pump. 5. Wing. 6. Hypopygium.

Head. AR 1.40. Ultimate flagellomere 700 μm long. Temporal setae 16, including 3 inner verticals, 2 outer verticals and 11 postorbitals. Clypeus with 14 setae. Cibarial pump, tentorium and stipes as in Fig. 4. Tentorium 167 μm long, 53 μm wide. Stipes 220 μm long, 73 μm wide. Palpomere lengths (in μm): 53, 57, 150, 141, 216. Length ratio of palpomeres 5/3 1.44.

Wing (Fig. 5). Anal lobe well developed. VR 1.02. Costal extension absent. R with 13 setae, other veins bare. Squamma with 34 setae.

Thorax. Anteprenotum with 13 setae. Dorsocentrals 11, acrostichals 15, prealars 6. Scutellars 35, multiserial.

Legs. Spur of fore tibia 70 μm , spurs of mid tibia 37 μm and 29 μm long, of hind tibia 77 μm and 25 μm long. Comb of 11 setae, shortest seta 27 μm , longest seta 48 μm . Width at apex of fore tibia 59 μm , of mid tibia 55 μm , of hind tibia 73 μm . Pseudospurs present on ta_1 and ta_2 of mid and hind leg, 22–28 μm long. Sensilla chaeticae absent. Lengths (in μm) and proportions of legs in Table 2.

Orthocladus (*Mesorthocladus*) *vaillanti* Langton & Cranston, 2005: 26; Makarchenko & Makarchenko, 2011: 117.

Material examined. 1 δ , Sichuan Province, Litang County, Shiliang River, 13 June 1996, light trap, WANG Xin-Hua.

Diagnosis. The species can be separated from other members of the subgenus by costal extension absent, crista dorsalis apically, and inferior volsella with dorsal part long and tapering.

Male ($n = 1$). Total length 4.73 mm. Wing length 2.95 mm. Total length / wing length 1.60. Wing length / length of profemur 2.89.

Coloration. Brown.

Hypopygium (Fig. 6). Tergite IX including anal point with 15 setae. Laterosternite IX with 7 setae.

Table 2. Lengths (in μm) and proportions of legs segments of male *O. (M.) vaillanti* Langton & Cranston.

	P ₁	P ₂	P ₃
fe	1 020	1 100	1 250
ti	1 275	1 150	1 400
ta ₁	875	575	825
ta ₂	585	390	460
ta ₃	400	300	360
ta ₄	250	190	220
ta ₅	170	150	175
LR	0.69	0.50	0.59
BV	2.26	2.74	2.83
SV	2.52	3.91	3.26
BR	1.65	2.14	2.55

Anal point 55 μm long, 19 μm wide. Phallapodeme 60 μm long; transverse sternapodeme 125 μm long, oral projections well developed. Gonocoxite 295 μm long, inferior volsella with dorsal part long and

tapering. Gonostylus 128 μm long; crista dorsalis apically, rounded; megasta 14 μm long. HR 2.30, HV 3.69.

Remarks. The species was primarily included in the subgenus *Orthocladus* s. str. (Langton & Cranston, 1991; Caldwell *et al.*, 1997; Caldwell, 1998), and it was transferred to the subgenus *Mesorthocladus* by Sæther (2005).

Distribution. The species was recorded in the Holarctic Region, and it occurs in Sichuan Province in Oriental China.

Key to male imagines of *Orthocladus* subgenus *Mesorthocladus*.

1. Virga well developed *O. (M.) lamellatus* Sæther
Virga weak or absent 2
2. Anal point with pointed apex *O. (M.) nimidens* Sæther
Anal point with rounded apex 3
3. Gonostylus widest medially, and crista dorsalis long and low
..... *O. (M.) tornalis* sp. nov.
Gonostylus not widest medially, and crista dorsalis not long and low 4
4. Costal extended beyond end of R_{4+5} 5
Costa not extended beyond end of R_{4+5}
..... *O. (M.) vaillanti* Langton & Cranston
5. Gonostylus slightly curved in dorsal part, inferior volsella large and rounded *O. (M.) kliskhoae* Makarchenko & Makarchenko
Gonostylus not curved in dorsal part, inferior volsella not large and rounded 6
6. Inferior volsella with dorsal part long and narrow, anal point distinct broad *O. (M.) frigidus* (Zetterstedt)
Inferior volsella with dorsal part not long and narrow, anal point not so broad *O. (M.) roussellae* Sponis

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中国直突摇蚊属中直突摇蚊亚属记述 (双翅目, 摇蚊科)

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摘 要 记述中国直突摇蚊属中直突摇蚊亚属 *Orthocladus* (*Mesorthocladus*) 雄成虫 3 种, 并对 1 新种 *O. (M.) tornatilis* sp. nov. 和中国 1 新纪录种 *O. (M.) vaillanti* Langton & Cranston 做详细描述。模式标本保存于南开大学生命科学学院摇蚊学研究室。

圆钝中直突摇蚊, 新种 *O. (M.) tornatilis* sp. nov. (图 1 ~

关键词 摇蚊科, 直突摇蚊属, 直突摇蚊属, 中直突摇蚊亚属, 新种, 中国。
中图分类号 Q969.442.6

3)

雄成虫与本亚属其它已知种的区别如下: 下附器背叶末端圆钝, 抱器端节中部最宽, 亚端背脊长而低。

正模 ♂, 吉林省长白山岳桦林, 1994-04-30, 扫网, 王俊才采。

词源: 新种种名源自其下附器背叶圆钝。

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